MARINE REVIEW.

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Naval Engineers' Reorganization Bill.

WHY THE NAVY NEEDS MORE ENGINEERS—STEAM POWER EIGHT TIMES WHAT IT WAS IN 1884, WHEN THE UPBUILDING OF THE NEW NAVY WAS BEGUN.

Of the many important features embodied in the Senate Bill 735 and H. R. 3,618, introduced by Senator Squire and Representative Wilson, the present note relates simply to the question of an increase in numbers. This section of the bill fixes the numbers in all grades at 303 instead of 170 as now allowed by law.

In 1882-3, when the upbuilding of the new navy was really begun in earnest, there were in commission about thirty-five steam vessels, aggregating not far from 25,000 indicated horse power. The growing importance of steam power versus sails was plainly seen at that time, and in the first designs prepared, the sail power was reduced while the steam power was enormously increased, judged from a relative standpoint. This tendency has gone on with an increasing ratio, and in such modern representative war ships as the Indiana, New York and Columbia, we have not a stitch of canvas. The result of this tendency is clearly brought out by a ccomparison of the steam power of our navy to-day and twelve years ago. We have above referred to its condition at the earlier date. We have now about the same number of vessels in commission, but their steam power aggregates about 200,000 I. H. P., or eight times as much as in 1883.

When the first signs of this tendency were clearly seen, what provision was made for designing and adequately caring for this increasing amount of machinery? Was provision made for strengthening the corps of naval engineers in proportion with their rapidly increasing duties? Not in the least. Their numbers instead were redneed in 1882 from 270 as allowed by law, or about 230 in actual service, to 170, such reduction to be brought about gradually by distribution over a term of years. This was a piece of legislation which has never been justified, and never can be. Its consequences have been greatly to the detriment of the service in general, and have fallen with crushing severity on many individuals.

The physical history of the engineer corps of the navy shows conclusively that its numbers are entirely inadequate for the duties placed upon it. The attempt to faithfully discharge these duties has resulted in an exhausting physical and nervous strain, under which several have broken down, and where life itself was spared, have been forced into retirement at an age when they should be in the active prime of maturity. This depletion has made matters so much the worse for those remaining, and thus in the natural course of events, the condition is growing worse instead of better.

Extended proof can not, of course, be given in the course of a short note. Abundant proof is, however, readily available for those interested, and it is to awaken interest in the matter that the present note is written. The engineer corps of the navy and its friends court the fullest investigation into its condition and needs, well knowing that such can only result in conclusively showing to every fair-minded man that the present and prospective members are entirely inadequate for the duties laid upon them, and that a point has been reached where some measure of relief is imperatively demanded.

The navy has today some eight times as much steam power as twelve years ago and yet under existing law it is proposed to care for this enormously increased amount of machinery with a corps of engineers reduced by the law previously referred to, and by casualty, to about 173 at the present time. That the machinery is a vital necessity to the efficiency and fighting capacity of a modern war ship, no one can think of denying. It follows as an unanswerable conclusion that the officers who design, care for, and superintend the operation of this machinery should be ample in numbers for the duties imposed upon them.

Every engineer in the United States feels a just pride in the magnificent success which has attended the developemnt of the new navy, and in the large share taken in this by the engineer corps under its able and forceful head, Com. G. W. Melville. The engineer corps of the navy has demonstrated its right to the confidence of the people, and we doubt not that it has it. In view, therefore, of the existing condition it is the plain and pressing duty of congress to provide the corps with a sufficient personnel, and no true friend of the navy will be satisfied with anything less than the modest increase called for in this bill.

Congress can not afford to allow the present session to go by without action on this point, and we would urge all who are interested in marine engineering, or in the good of the naval service at large, to do all in their power to bring this question strongly before the members of congress, and to urge the fullest and most impartial investigation. With the facts of the case made clear, the engineer corps has nothing to fear as to the outcome of this measure of relief.

North Sea and Lake Superior Commerce.

Hamburg, Bremen, Antwerp, Rotterdam and Amsterdam are the foremost continental maritime ports on the North sea, and yet the combined commerce of these five ports in 1894, the greatest year in the history of any of them, was in round numbers but 2,000,000 tons more than the commerce passing to and from Lake Superior, through the two canals at St Mary's falls, during a little more than seven months of navigation in 1895. The figures, which are official in both cases, are as follows:

1894.

	Vessels.	Net Reg. Tons.
Hamburg	9,165	6,228,750
Antwerp	4,721	5,002,704
Rotterdam	5,109	4,143,403
Bremen	4,178	2,172,075
Amsterdam	1,666	1,281,340
Total	24,839	18,828,272

1895.

	Vessels.	Net Reg. Tons.
United States and Canadian canals at Sault Ste. Marie	17,956	16,806,781

It will be noted that the number of vessels involved in the commerce of the North sea ports is much greater than the number passing through the Sault canals, but this only indicates that vessels engaged in the lake trade are of a class larger than that prevailing in the North sea trade.

A Sound-Catching Instrument.

Officers of the United States light-house service have been experimenting with the eophone, an instrument which is designed to determine, in fog or darkness, the location, both as to direction and distance, of any sound. It is formed of two bell-mouthed sound receivers, placed one on each side of a sheet of metal or other material extending some distance in front of the receivers. A tube from the left hand sound receiver is placed at the left ear of the person operating the eophone, and a tube from the right-hand receiver at the right ear. When the sound is heard with equal plainness in both ears the instrument is pointing in the direction of the sound. When the sound is heard with greater plainness in one ear than in the other the instrument is pointing at an angle with direction of the sound. It is the invention of Frank de la Torre of Baltimore. The sensitiveness of the instrument is remarkable. The ripple of oars is said to have been detected in the night time when the rowers were trying to row as silently as possible. The eophone is attached to the top of the pilot house, the tubes from the receivers being brought inside the house for use by the pilot. The instrument can be turned in any direction.

To Use the New Sault Lock Late Next Season.

Although the United States engineers in charge of St. Mary's Falls canal improvements are not disposed to admit that it will be at all possible to use the new lock until the spring of 1897, one of the news agencies at the Sault has sent out a circular letter, in which it is claimed that the engineers, although unwilling to state the matter officially, are really in hope of having the new lock so far completed by July 15 next that they will be ready to lock vessels by night after that date. It is also claimed that by the same date the sections of the 20-foot channel at Little Mud lake and Sailors' Encampment, as well as the work at Vidals shoal, will have been so far advanced that a 200-foot channel of 20 feet depth will be available at Vidals shoal, with a 150-foot channel of 20 feet depth at Little Mud lake and the encampment. If these expectations are realized, a material increase in draft for vessels in the Lake Superior trade may be expected towards the close of next season, but it is unfortunate that the engineers in charge of the dredging operations and canal work do not publicly announce their opinions. The letter from the Sault also reports the water a little better than it was at this time a year ago.

Officers of the Bath Iron Works, Bath, Me., are: President and manager, T. W. Hyde; treasurer, E. W. Hyde; superintendent engineering department, J. S. Hyde; consulting engineer, C. E. Hyde; purchasing agent, J. S. P. Burke.

"ROPER'S LAND AND MARINE ENGINES," BOUND IN MOROCCO WITH FLAP AND POCKET, WILL BE MAILED TO ANY ADDRESS FOR $3.50 SENT TO THE MARINE REVIEW, CLEVELAND, O.

MEMBERS ATTENDING THE TWENTY-FIRST ANNUAL CONVENTION, NATIONAL MARINE ENGINEERS' BENEFICIAL ASSOCIATION, HELD AT WASHINGTON, D. C., JANUARY 20TH TO 26TH, 1896.

1 WM. SHEFFER, 5, Baltimore, Md.
2 N. S. LAWRENCE, 62, New London, Conn.
3 OTTO BOETTGER, 5, Baltimore, Md.
4 F. W. PARKER, 53, Marine City, Mich.
5 GEO. W. ROUSE, 33, New York.
6 THOS. F. DOWD, Nat'l Secretary, 4, Chicago.
7 GEO. UHLER, Nat'l President, 33, New York.
8 J.J. SEARLY, Nat'l Vice-Pres., 35, San Francisco
9 J.J.A. WILLIAMS, Nat'l Treas ,15, New Orleans
10 PATRICK ROACH, 91, Ashtabula, Ohio.
11 JOHN HENRY, 92, Saginaw, Mich.
12 CHAS. ELLIS, 63, Albany, N. Y.
13 J. H. COLLINS, 9, Milwaukee.
14 A. McGILLIVRAY, 78, Duluth, Minn.
15 WM. T. McCAULEY, Chicago.
16 GEO. A. GRUBB, 4, Chicago.
17 C. M. STODDARD, 2, Cleveland, Ohio
18 W. E. YATES, 33, New York.
19 H. J. McAULEY, 2, Cleveland, Ohio.
20 SAM'L HALL, 13, Philadelphia.
21 E. P. WATSON, 33, New York.
22 A. J. IRWIN, 85 Alpena, Mich.
23 EDWARD JORDAN, 5, Baltimore, Md.
24 J. McG. STERRITT, 33, New York.
25 JAS. T. GODWIN, 101, Norfolk, Va.
26 THOS. KENDALL, 101, Norfolk, Va.
27 FRANK A. JONES, 35, San Francisco.
28 C. W. ROBINSON, 93, Washington, D. C.
29 CHAS. W. MARTIN, JR., Jenkins Bros., N. Y.
30 J. ISAAC JOHNSON, 33, New York.
31 D. E. HAMMOND, 33, New York.
32 WM. J. DU BOIS, 33, New York.
33 H. C. MAGEE, New York.
34 E. R. BLANCHARD, 3, Detroit, Mich.
35 JOHN T. COOK, 59, Boston, Mass.
36 E. R. DUNGAN, 3, Detroit, Mich.
37 LEWIS McALLISTER, 13, Philadelphia.
38 P. E. LEAHY, 33, New York.
39 JOHN J. HARRISON, 33, New York.

Senator Frye Defends the American Line.

The commerce committee of the senate has reported favorably Senate Bill No. 1,242, the measure upon which the organized marine engineers of the country have centered all efforts in the present congress, and it is now more than probable that the bill, if carefully handled by the engineers and their representatives, will become a law. The senate committee made a few amendments, notably the removal of the clause providing for renewal of licenses for five years, but the changes were agreed to by the engineers. Senator Squire's criticism of the International Navigation Co., upon introducing this bill, will be remembered by readers of the REVIEW. It was very severe and the engineers are probably fortunate that it did not result in open opposition to their organization from Senator Frye, who is a most influential member of the senate, especially in matters of this kind, and undoubtedly the best-posted man in the senate on maritime affairs. As matters have finally shaped themselves, Senator Frye is not opposed to the measure, but when it was reported from committee he did not allow the opportunity to pass without answering Mr. Squire. He said:

"When the senator from Washington (Mr. Squire) introduced this bill he censured very severely indeed the International Navigation Co. for its attitude towards this question of American citizenship, making charges which could not be sustained by facts; not that he himself would deal unjustly with anybody—I know that he would not—but he was simply crammed with misinformation. I can not allow that to pass without notice, because the International company is, to a large extent, a child of my own, and I am proud of it. In the course of his remarks the senator from Washington cited the fact that the St. Paul, with her foreign engineers, had run aground and that several of them had been killed. As a matter of fact two of the engineers who were killed were native born American citizens and the other one had filed his intention to become a naturalized citizen. I assert without fear of contradiction that there is not a line of steamships in the United States which has done so much to promote American citizenship as this same International line. They are educating to-day under the law—and no other company is doing it—forty-six American-born boys as cadets, who are to be thoroughly educated to fill the petty offices and up to that of commander of the ship, taking, I think, from four to six years' time.

"Furthermore, it was stated by the senator that the engine rooms were officered almost entirely by foreigners. The St. Louis has twenty-four men in the engine room, twenty-one of whom are citizens, thirteen of them native born, and three have declared their intention to become citizens. The St. Paul has twenty-seven men in the engine room; twenty-two of them citizens, nine of them native born, and five have declared their intention to become citizens. The Paris has twenty-four men in the engine room; eighteen are citizens, three native born, and four have declared their intentions to become citizens. The New York has twenty-five men in the engine room, fourteen of whom are citizens, and eleven have declared their intention to become citizens. In other words, out of a total of 100 men engaged in the engine rooms of these four ships, seventy-five are citizens, twenty-seven native born, twenty-three have declared their intention and will in due course of time become citizens, and only two of the entire force are aliens who have not declared their intention. The act of March 3, 1891, provided that vessels employed in the mail service should be officered by American citizens in conformity with existing law. Under the advice of the attorney general it was held that engineers were not officers. Complaint was made by the American engineers that this was a wrong construction of the law, and the bill reported to-day is intended to correct the law and require American citizenship, and it is reported unanimously from the committee. I am in favor of American citizenship for the officers of our ships just as earnestly as the senator from Washington, but when the New York and Paris came under the American flag they had in their engine rooms men who had been brought up with that machinery, who understood it thoroughly and completely; and with the number of lives that might be put in peril on board those great ships, and with the enormous amount of property, they could not at once change every one of those officers, and they ought not to have done it, but so fast as they could they have made the changes.

"Now consider another thing. The law required that within a certain time 25 per cent. of the crew of these vessels should be American citizens. They have gone away beyond that requirement of the law. The St. Louis, with an average crew of 382, has 164 of them American citizens. You can not find the same proportion on another vessel in the United States, in my judgment—sailing ship or steamship. The St. Paul, with an average crew of 309, has 162 citizens. The New York, with an average of 413, has 156 citizens. The Paris, with an average crew of 382, has 159 citizens. Many of the aliens in all the departments of the steamers have declared their intention, taken out their first papers, and are only awaiting the time required by the law before taking final papers and becoming citizens. Under the law and regulations the deck officers below the grade of second mate are not required to be citizens, but on this American line, which has been so seriously criticised as employing foreigners, every officer in each ship is a citizen of the United States, and the foreign element is made up largely of waiters and stewards, and you can not always get Americans to act in those places. That is the reason they are foreigners. Nor is this disposition to favor and promote citizenship confined to the four ships which have been Americanized or which are floating the American flag. The International Navigation Co. has twenty-two steamships. Of those nine sail under the American flag, four under the British flag, and nine under the Belgian flag. One of the British ships is a spare, not now in commission. Of the twenty-one ships in commissson, nineteen are commanded by American citizens and only two by aliens, notwithstanding the ships themselves are alien and under foreign flags. There are employed upon those twenty-one steamers eighty-five officers, sixty-five of whom are citizens and only twenty aliens. Out of a total of 106 commanders and officers, eighty-four, or 79¼ per cent., are citizens of the United States, and those, remember, are engaged in Belgian and British ships as well as on American steamers. Mr. President, I believed it to be my duty, in justice to this line, to say what I have and to indicate to the senate how marvelously well this line, which has been so seriously attacked, is performing its duty touching American citizenship, and is more than meeting all the requirements of law."

The Marine Engineers.

A supplement accompanying this issue of the REVIEW contains portraits of leading marine engineers from all parts of the United States. The group is made up of representatives of the various branches of the national organization of marine engineers, who met in annual session in Washington recently. The marine engineers now have before congress a bill, which was introduced by Senator Squire of Washington, and for the passage of which the organization is making the greatest effort that it has ever made in any matter of state or national legislation. It is a just measure, as its main object is to have engineers recognized as officers of steam vessels, so that Americans only shall be employed as engineers. The bill, which was framed in accordance with the views of officers of the national organization of engineers, has been reported from committee to the senate with a few amendments that are accepted by the engineers, and there is every reason to anticipate its passage, but in order to fortify their position the Cleveland branch of the national body at its last meeting adopted the following resolutions, which were probably submitted also to all branches of the organization throughout the country:

WHEREAS, A few years ago a bill was passed by congress granting a subsidy to American steamers for carrying the mails to foreign countries, stipulating that said steamers should be officered by American citizens, with the idea in view of building up an American merchant marine manned by American citizens who could be depended upon in time of war with a foreign country, and

WHEREAS, The American line of steamers are manned in the engine room principally by foreigners, through the greedy and un-American policy of its managers in declaring that engineers were not officers, which declaration was supported by Secretaries Carlisle and Foster; be it

RESOLVED, That we heartily agree and commend the bill introduced by the Hon. Watson C. Squire in the United States senate, known as Senate Bill No. 1242 "to improve the merchant marine engineer service and thereby also increase the efficiency of the naval reserve," and we herewith extend our hearty co-operation to Senator Squire and earnestly hope he may meet with success in his efforts to enact a law which will make engineers officers in the eyes of the law, and bona-fide American citizens, and which will prohibit men who have only taken out their first papers, and who may have no intention of going further in that direction, and upon whom we could not depend in an emergency, from holding so important and vital an office as engineer in our merchant marine service.

Big Atlantic Ships.

Of the four twin-screw freight and passenger steamers, for which the North German Lloyd Steamship Co. let contracts recently, and which are for the New York line, the Vulcan company of Stettin will build two, Messrs. Blohm & Voss of Hamburg one, and F. Schichau of Elbing one. Leading features of these new ships are: Length, 525 feet; beam 64 feet; tonnage 10,000; speed, 14 knots. They will have accommodations for 200 cabin and from 1,500 to 2,000 steerage passengers. Besides these four ships, two other steamers are to be built, one by the Vulcan Works and one by Mr. Schichau, Elbing, of the following general dimensions: Length about 600 feet and beam about 66 feet. The price to be paid is about $4,750,000. The regular service speed will be about 21 knots. As each firm received the contract on its own plans, these vessels will not be sisters.

Mr. E. T. Evans, general manager of the Anchor Line, Buffalo, has gone to Europe.

Appointments of Masters and Engineers.

Marine Transit Co., Marine City, Mich.: Steamers—Aztec, Capt. Jas. W. Baby, Engineer Amos Horton; Toltec, Capt. Jas. Taylor, Engineer Chas. G. Pierce. Schooners—Zapotec, Capt. Peter Thomson; Miztec, Capt. Henry Shackett.

Palmer & Gordon, Cleveland. Steamers—Geo. Presley, Capt. J. D. Mullen, Engineer Chas. Steadman; W. L. Wetmore, Capt. Frank Rice, Engineer Chas. Martin. Schooners—Nellie Redington, Capt. Wm. Parker; Brunette, Capt. F. A. Pitcher.

Beyschlag, Chas., St. Clair, Mich.: Steamer—P. J. Ralph, Capt. H. Leisk, Engineer W. J. Bolton. Schooner—Harold, Capt. Thos. Leisk.

Stevenson, John, Detroit: Steamers—C. H. Starke, Capt. Wm. Crosby, Engineer John Lacy; Toledo, Capt. Geo. Burns, Engineer, C. Jubimille; Hattie, Capt. N. L. Stewart, Engineer I. Morrison; Sakie Shepherd, Capt. Geo. Ferguson, Engineer John Elsey; Bessie, Capt. Oliver Boshaw, Engineer John Fortier; Mascotte, Capt. ————, Engineer. ————.

Port Huron & Washburne Line, T. R. Wright, manager, Port Huron, Mich.: Steamers—Colorado, Capt. J. C. McLean, Engineer Thos. F. Birch; Osceola, Capt. John McLeod, Engineer Thos. H. Morril.

Jenkins, John, Marine City, Mich.: Steamer—W. H. Sawyer, Capt. John Jenkins, Engineer Nelson Gillette. Schooners—C. E. Redfern, Capt. Owen Townsend; A. C. Tuxbury, Capt. Wyman Powers.

Eagle Transportation Co., Simon Langell, managing owner, St. Clair, Mich.: Steamer—O. T. Flint, Capt. R. O Conor, Engineer W. H. Hanlon.

Cummings, M. J., Oswego, N. Y.: Steamers—Charles Stewart Parnell, Capt. P. Griffin, Engineer George Wilson; Mont Eagle, Capt. Wm. Griffin, Engineer Joseph Jameison.

Fletcher, F. W., Alpena, Mich.: Steamer—F. W. Fletcher, Capt. H. D. Moore, Engineer Wm. Brake. Schooners—Porter, Capt. N. McDonald; Golden Rule, Capt. C. W. Recor.

Holland, N., Buffalo: Steamer—C. F. Curtis, Capt. Jas. Cunningham, Engineer Wm. Cunningham. Schooners—Isabel Reed, Capt. Peter Johnson; T. S. Fasset, Capt. Albert Renders; N. C. Holland, Capt. Peter Keischgens.

Northern Steamship Co., Buffalo: Steamers—North West, Capt. George A. Miner, Engineer M. Toner; North Land, Capt. H. W. Stone, Engineer ————; North Wind, Capt. D. Wait, Engineer T. W. Jackman; Northern Light, Capt. M. J. Haberer, Engineer F. Harringer; Northern Queen, Capt. E. M. Smith, Engineer A. T. Stewart; Northern Star, Capt. William Thorn, Engineer W. T. Pike; Northern Wave, Capt. Martin Niland, Engineer Fred Potts; Northern King, Capt. W. B. Murch, Engineer John A. O'Mara.

Ship Yard Matters.

On Saturday of this week F. W. Wheeler & Co., West Bay City, Mich., will launch two ore-carrying steamers of the largest class, one for the Roby Transportation Co. of Detroit, to be named L. C. Waldo, and the other for the Eddy-Shaw company of Bay City, to be named City of Bangor. Double launches have become quite common on the lakes of late, but no such ships as these have up to this time been launched from one yard on the same day. D. T. Ford is an expert in steel ship construction who is employed by the Standard Oil Co. He is looking after Mr. Rockefeller's interests in the construction of two ships at the yard of the Globe company, Cleveland, and three at F. W. Wheeler & Co's yard, West Bay City. Upon his return from a first trip to West Bay City, a few days ago, he said that he had not seen in this country a ship building plant that was in any way better equipped than that of Wheeler & Co. In extent, it was second only to the plant of the Newport News Ship Building & Dry Dock Co., and when all improvements were completed at West Bay City, he said, the works would be little behind those at Newport News as regards capacity. Mr. Ford's impression of the plant of Wickes Bros., where he saw some of the finest and most thorough work on boilers that he had ever witnessed, were equally complimentary.

Mr. Edward Gaskin, superintendent of the Union Dry Dock Co., Buffalo, informs the REVIEW that his company has secured from the Standard Oil Co. the contract for the oil tank barge, which was described on the first page of our last issue, and which is to take the place of the two Standard Oil barges now on the lakes, after they are taken to the coast next fall. The new barge will be 254 by 40 by 23 feet, and will be suited to carrying ore if it is necessary at any time to have her engage in the ore trade. This barge was designed by John Haug of Philadelphia. The vessel is not to be delivered until May 1, 1897.

Mr. F. P. Gordon, who will represent on the lakes Johnson & Higgins, well-known insurance brokers of New York, informs the REVIEW that the Buffalo office of the firm will be located in the Guarantee building, corner of Pearl and Church streets, and will be opened sometime between the 1st and 10th of next month.

Management of the Rockefeller Ships.

The twelve ships—seven steamers and five tow barges—that are being built in lake ship yards for Mr. John D. Rockefeller, will be managed in the office of Oglebay, Norton & Co., ore sales agents, Cleveland. Mr. Rockefeller will have a representative in Cleveland, who will be associated with Oglebay, Norton & Co., and who will in turn have for an assistant some vessel captain, yet to be selected, who will be in direct charge of the shore affairs of the vessels. It is probable that this appointment of a commodore for the fleet will be made shortly, as he will probably be required to take out the first vessel, which is expected to be in readiness some time between May 1 and June 1. All of the ship builders engaged in the construction of the Rockefeller ships will be pressed in fulfilling their contracts and in some cases penalties may be levied, as it is understood that in two instances, at least, the requirements call for a forfeiture of $100 a day for every day after the time fixed for delivery of the vesaels. Oglebay, Norton & Co. have had charge of the sale of Mr. Rockefeller's Mesabi ore and this is the main reason for associating the management of the ships with their office. As noted in a previous issue, three of these ships are to be classed for insurance purposes in the United States Standard Register of Shipping, New York, three by the Bureau Veritas, which is the French society, and five by John Haug of Philadelphia, who represents the British Lloyds. If Mr. Haug's inspection results in these five ships (two at the Globe yard Cleveland, and three at Wheeler & Co's. yard, West Bay City) being classed at Lloyd's, they will be the first lake vessels to secure full recognition by the British classification society.

The announcement that Manager Hebard of Buffalo, representing the "Soo" line of package freight steamers, has leased the steamer John Pridgeon for next season is significant, as it is understood that the whaleback steamers Pillsbury and Washburn, over which some difficulty has existed between the American Steel Barge Co. and the "Soo" railway managers, are to again come into the hands of the builders, and they will probably be found carrying Rockefeller ore next season.

A Question for Naval Architects or Ship Builders.

To the Editor of MARINE REVIEW:—In regard to laying down ships' plans on paper, I have often asked the question: Which is the correct way to lay a vessel down, stem to the right or to the left hand side? The answer one invariably gets is that either way is correct, but I argue that surely one method has an advantage over the other. One ship builder gave me as his reason for laying the stem to the left on a side elevation, that the name on the bow and on the flags in this way read better, and as they should, from left to right. But the practice in the best equipped offices at home and abroad is to lay the ship down with her stem to the right, and, of course, all the other plans, such as deck and cabin plans, similarly. If all ship builders would adopt one and the same method, it would facilitate work a great deal in laying plans of different vessels alongside of each other for purposes of comparison.

The numbering of frames is another point on which all naval architects or ship builders do not agree. Some call the first frame abaft the stem No. 1, the second No. 2, and so on in succession to the sternpost, the last one on the stern post being called transom. Other builders begin aft and say transom No. 1, No. 2, etc, up to the last number, calling the last one knighthead, when on a cut-water stem, as on sailing ships. But the practice in some of the largest and best conducted ship yards is to number from amidships towards both ends of the vessel, so that at "dead flat," or amidships, there are two frames bearing the number 1. One of them is on the forward and the other on the after body. According to this method, a vessel 400 feet long with frames spaced 2 feet apart, has frames numbered just up to 100 on the fore body, and the same on the after body, the difference being distinguished by prefixing the letters F and A respectively. Any ship builder can tell by a glance at a frame whether it belongs to a fore or after body, except, perhaps those in the middle body nearly amidships. I should like to have an expression of opinion on these matters from some authority through the columns of your widely circulated journal.

NOAH.

Manitowoc, Wis., Feb. 26, 1896.

Representatives of the several lake insurance agencies that publish the Inland Lloyds Register finished their task of revising the register in Cleveland, Thursday, and the book will be printed at once. Vessels under repairs are left without rating or valuation. It is understood that on the whole the valuatious have, if anything, been increased, although the difference as compared with last year is not great. Changes are not radical enough to look for any great amount of complaint upon the appear ance of the new book

Practically an entire floor of the Board of Trade building Duluth will be used for office purposes, after March 1, by the management of the Northern Steamship Co. Buffalo will in future have only branch offices of the company.

Mutual Line Steamer Coralia.

Five minutes before the big Mutual line steamer was launched in Cleveland, Saturday, Messrs. Pankhurst and Allen of the Globe company decided, upon suggestion from Miss. Lillian Hanna, to name her Coralia. This is in accordance with the scheme of having the names of all vessels of this line begin with a C and end with an A—as Cambria, Corsica and Corona. The name honors Mrs. L. C. Hanna, wife of the president of the company, whose given name is Corelie. The letter E occurring twice in Mrs. Hanna's name is in both cases changed to A to make a name for the ship, and at the same time the system of names for this line is maintained. Miss Lillian Hanna, sister of M. A., H. M. and L. C. Hanna, all of whom are interested in the Globe company and the Mutual and Menominee lines, christened the steamer. The launch was in every way successful. Capt. Wm. Cumming will sail the Coralia and Andrew Haig will be chief engineer.

This new ship is the largest craft now afloat on the lakes. She is 432 feet over all, 412 feet keel, 48 feet beam and 28 feet moulded depth. None of the big ships to come out in the spring will be of greater dimensions. Two of the Rockefeller steamers, under construction at the same yard, are to be of the same dimensions. It may be that something larger will be built for 1897, but the Coralia will be at the head of next season's big fleet. At 14 feet 6 inches draft she is expected to carry 4,180 net tons; at 16 feet, 4,990 tons; at 17 feet, 5,539 tons; and at 19 feet, if such a draft is ever secured in lake channels, she is expected to carry 6,680 tons.

M. A. Hanna & Co., of Cleveland, who manage the affairs of the Mutual Transportation Co., to which the Coralia belongs, are among the leading miners and shippers of Lake Superior ore. They control docks at Ashtabula, and they are making arrangements at that port to unload this vessel in a single day. They are also making arrangements for 17 feet draft into Ashtabula next season and up to their docks. If they succeed in carrying out these plans, this steamer will carry some very large ore cargoes from Escanaba, as it is expected that with any improvement in water levels next season the completion of the several sections of the 20-foot channel between Lakes Huron and Erie will afford 17 feet draft in the rivers.

The Coralia is built much stronger than most large vessels in the ore trade. Her construction is in accordance with what is known as the web-frame cellular bottom system. She has a 5-foot water bottom, the outer ballast capacity of which is about 2,200 tons. Twelve big hatches, spaced 24-foot centers, are intended to permit of her being unloaded in a day. Deck houses will be built in accordance with the practice usually followed in providing for crews on ore carrying vessels, but the captain's quarters, extra state rooms, etc, will be elegantly furnished in hard wood. As the pilot house and other forward quarters are to be astern of the hatches nearest the bow, the open appearance of the long stretch of deck amidship that might be looked for in such a lengthy ship, will be partly overcome.

Her triple expansion engines have cylinders of 24, 39 and 63 inches diameter and the stroke is 42 inches. Boilers will be four in number, each 10 feet diameter and 11 feet 8 inches long, allowed 160 pounds working steam pressure to the square inch. The total heating surface is 4,336 square feet and the grate surface 160 square feet.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Feb. 22, 1896:

	Wheat, bushels.	Corn, bushels.
Chicago	20,385,000	3,429,000
Duluth	11,135,000	85,000
Milwaukee	405,000	2,000
Detroit	291,000	23,000
Toledo	727,000	597,000
Buffalo	2,200,000	105,000
Total	35,143,000	4,241,000

As compared with a week ago, the above figures show at the several points named an increase of 48,000 bushels of wheat and a decrease of 28,000 bushels of corn.

On Feb. 22, there was afloat at Chicago 188,000 bushels of wheat, 4,015,000 bushels of corn and 48,000 bushels of oats; at Buffalo, 259,000 bushels of wheat, 223,000 bushels of oats and 250,000 bushels of barley; at Duluth, 512,000 bushels of wheat; and at Milwaukee 176,000 bushels of wheat and 120,000 bushels of oats.

Portable Steam Hammer For Use in Ship Yards.

A most useful tool for ship yards is the portable steam hammer for welding up stern and rudder frames. It has always been a most difficult and rather imperfect operation to unite these parts properly by hand hammers, and they are usually too broad to be accessible to the ordinary fixed steam hammer. Two large parts of a stern frame have usually to be heated in situ, while placed together in the position which they are to occupy when welded. They are heated at the parts of the junction in open fires. When brought up to a welding heat the fires have to be withdrawn quickly, and the piece called a "glut" is brought at a welding heat from another fire, and is hammered into the space where the joining takes place. This has usually been done by a heavy sledge hammer having three or more shanks, and handled by as many men. But by this mode the welding is very unreliable.

The hammer is much too light to make a solid weld, and the work is done at a great disadvantage, and with harassing labor. The portable steam hammer has altered all this. It resembles the ordinary smithy steam hammer, except that, instead of the cylinder being attached to a fixed column, it is carried by a jib, like a crane, can be raised or lowered, swung around, or moved to and fro until it is exactly over the work, and by a few heavy blows the welding is done most effectually. The workman who manipulates the hammer and the racking gear is stationed at the base of the crane, quite out of the way. This movable steam hammer has rendered the welding of stern frames and similar forgings quite an easy and satisfactory operation. It was first brought out by Messrs. Bennie of Glasgow, and was first set to work on stern frames in the works of the Parkhead Forge Co. of that city. The kind of work this hammer does could not easily be executed by a hydraulic press.—J. Arthur Gray, English Engineer.

In General.

Harland & Wolff, well-known Belfast ship builders, are said to have under contemplation the establishment of a large ship yard on the banks of the Mercy, near Liverpool.

Fifty-two out of 526 steamers built in the united kingdom during 1895 were of more than 4,000 tons register. Twenty of these fifty-two vessels were over 5,000 tons, while twelve exceeded 6,000 tons, including all the vessels, seven in number, built by Messrs Harland & Wolff, which ranged from the Vedamore, of 6,662 tons, up to the Georgic, of 10,077 tons, now the largest cargo carrier afloat. Twenty-five of the fifty two vessels over 4,000 tons were Clyde productions, while fourteen emanated from the Tyne, Wear, and Tees districts, and the remainder were constructed at the two ship building establishments at Belfast.

A definite official statement of the cost of the Kiel canal shows the aggregate to have been a little more than $39,000,000. The canal is about 61 miles long, 20 feet deep at dead low water, and 229 feet wide, in numerous places the width increasing to some 428 feet, to allow the largest vessel to pass each other, and work will be continued until vessels of any depth can pass at low water. The embankment is stone lined to a depth of 6 feet below the water, and the locks at the North Sea end of the canal are said to be the largest in the world, with the exception of that at Bremerhaven. Two bridges span it at a height of 137 feet above the water, and there are also six opening bridges and sixteen ferries.

A correspondent directs attention to the fact that, although the Messrs. Denny, Clyde ship builders, are the only private firm having an experimental tank for determining speed and other characteristics of ships from small models, other firms have for some time carried on a system of small-scale experiments prior to actual building. "Messrs. J. & G. Thomson, for example," he says, "have in a quiet way conducted experiments on the Clyde with small electric launches, from which, by means only known to themselves, facts have been deduced which have been of considerable service in guiding them in the designing of the hull, and especially of the propulsive agents, of torpedo boat destroyers and other high speed-craft."

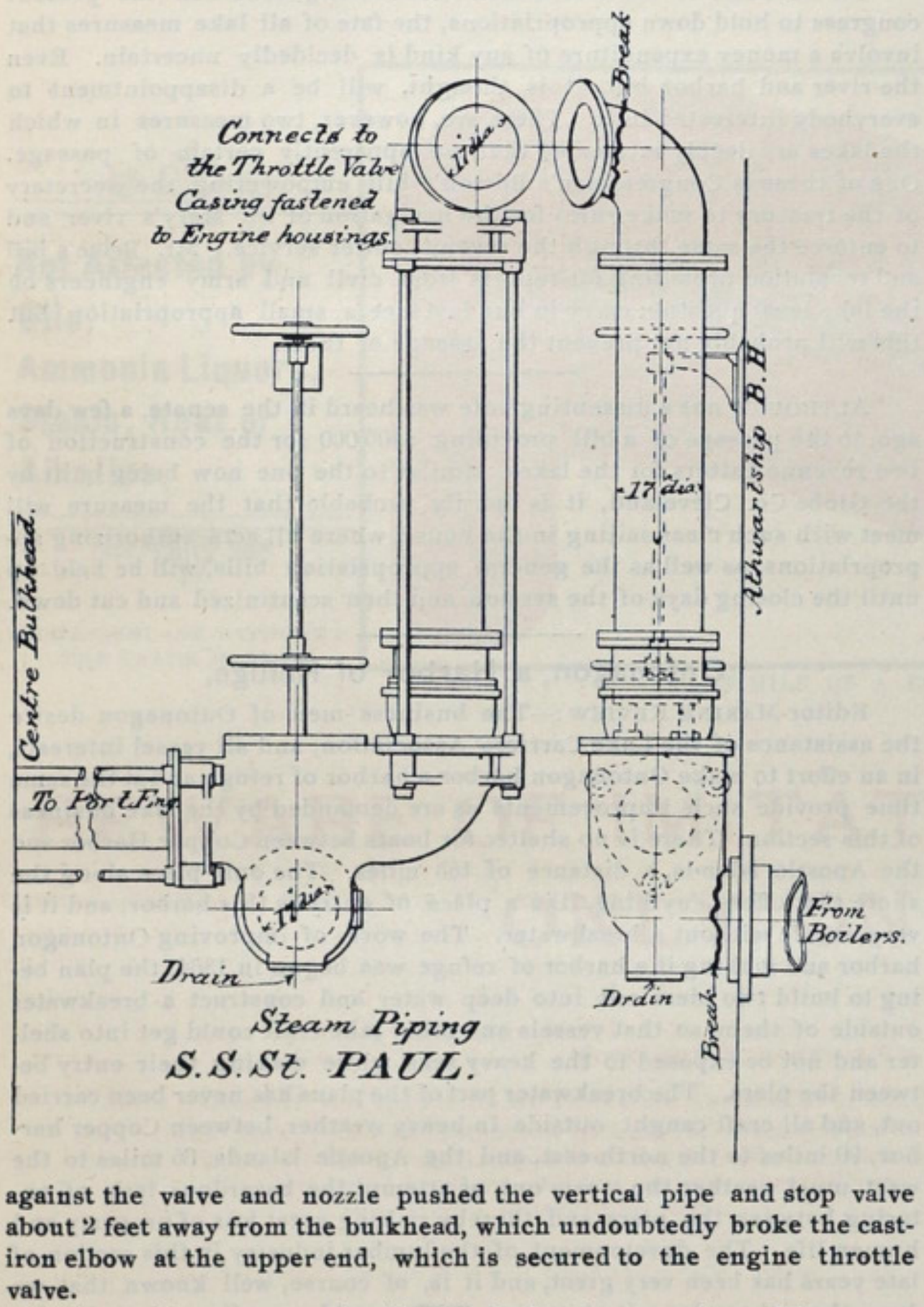
Another Coal Concern in the Fueling Business.

Another well-known lake coal shipping concern, the Pittsburg & Chicago Gas Coal Co., represented by J. A Donaldson, who has offices in the Perry-Payne Bldg., Cleveland, is to engage in fueling business during the coming season. The dock to be used is that just above Main street bridge on the west side of the main river, extending from the bridge up to the warehouses and dock used by the Union Transit Co. It is equipped with McMyler rotary hoists and 2½-ton buckets. The company is having built at Fairport a lighter of 300 tons capacity, which will also be used in the fuel business. The Pittsburg & Chicago company has a coal shipping dock in Cleveland above Seneca street bridge and ore receiving dock just below the same bridge. Mr. Donaldson is also agent for the Pittsburg, Fairport & Northwestern Dock Co., which has extensive shipping interests at Fairport, and for the Pittsburg Consolidated Coal Co. at Erie.

TWO NEW CHARTS OF THE ST. MARY'S RIVER, FROM ENTRANCE TO MUD LAKE TO POINT IROQUOIS, INCLUDING HAY LAKE CHANNEL, RECENTLY ISSUED BY THE WAR DEPARTMENT, MAY BE HAD FROM THE MARINE REVIEW AT 35 CENTS EACH.

Accident on the St. Paul.

Marine engineers and others who have a knowledge of the machinery of large vessels will be interested in an intelligent account of the explosion which took place in the engine room on the American line steamer St. Paul recently, when nine persons were killed and others severely burned. The explosion was caused by the rupture of the nozzle of the starboard engine room stop valve, which was bolted against the bulkhead and the flanges of the main steam pipe leading from the boilers. In the accompanying sketch the tie rods have been omitted from the right-hand elevation. This main steam pipe is of lap-welded iron and 17 inches in diameter. The thickness of the cast-iron stop valve at the point of rupture averaged 1⅝ inches. The two high pressure cylinders of each engine received steam through this main steam pipe. The outlet nozzle of this main stop valve is on the starboard side of the valve turning upward joined to a vertical lap-welded pipe made of iron with rolled steel flanges. There is a slip joint in this length of pipe. The upper part of the pipe bolts directly to a cast-iron elbow. The other end of the cast-iron elbow is bolted directly to the throttle valve. The nozzle of the main engine room stop valve, which is bolted directly to the bulkhead, was broken circumferentially very close to the flange, which is bolted to the bulkhead. When this broke off, the pressure of steam



against the valve and nozzle pushed the vertical pipe and stop valve about 2 feet away from the bulkhead, which undoubtedly broke the cast-iron elbow at the upper end, which is secured to the engine throttle valve.

The accident occurred at 7 o'clock in the morning. Fires were started in the boilers about 10 o'clock the previous evening. The boiler stop valves were opened early the following morning and before steam had formed, putting all the boilers in communication with each other and with the main steam pipe up to the engine room bulkhead. This main steam pipe, which extends to the forward set of boilers, is about 150 feet long, decreasing in diameter from 17 inches at the engine room bulkhead as it goes forward. There was about 60 pounds of steam on at 4 o'clock, and it was stated that the engine room stop valve—the nozzle of which was broken—was raised from its seat a very little, so as to allow the steam pressure to be on the other side of the valve and warm up the engine. There were four 1-inch drain pipes on this length of steam pipe on the boiler side of the bulkhead—the last one being on the broken stop valve—and the valves of these drain pipes were all said to be open, and were found open after the explosion. Just before 7 o'clock, two men were sent to ease the main stop valve from its seat and open it. This valve was raised from its seat about $\frac{3}{16}$ of an inch, and found in this condition after the explosion. There were no premonitory signs of water hammer, but one heavy blow was noticed by men near by. Every one in the engine room that knew anything about the circumstances was killed. The stop valves were made of cast iron, and the material of which had all been subjected to a tensile test, the minimum tensile test having been about 23,000 pounds. The pipes and valves were amply strong to sustain the working pressure of 200 pounds per square inch, and there was but 130 pounds pressure on the boiler at the time of the explosion.

The jury which investigated this case concluded its verdict as follows: "We find that the said rupture was not caused by the neglect of the steamship company, or of any of its employes. We further find that the main steam pipes and the stop valves pertaining to the same were and are properly constructed to safely bear the intended working steam pressure of 200 pounds per square inch, and that the pressure on the boilers and pipes did not exceed 130 pounds at the time of said rupture. While we find that the system of drainage of the main steam pipes and stop valves is that usually provided on steamships, were commend that the drain pipes on the main steam pipes and stop valves in question be enlarged to allow better drainage."

New valves and elbows were fitted shortly after the accident and since then a pass-over valve has been put on the new stop valve and the drains have been enlarged.

Duluth Freights—Grain, Lumber and Coal.

Duluth, Minn., Feb. 26.—No change has occurred in freight matters here during the week. There is still a limited inquiry at 3 cents, opening shipment, but it is probable four or five cargoes would supply this demand. Two cargoes were worked last week at 3⅛ cents, but this rate was obtained outside the regular shippers. It does not seem probable there will be any active inquiry for grain tonnage for some time, although this is a matter of conjecture. This opinion is prompted by the unsatisfactory condition of the money market, and for the additional reason that elevators are asking an unusual price for May wheat at the present time. Five days of last week were marked by very cold weather, but this was followed by a thaw and about all the advance achieved in the way of ice making was dissipated. A remarkable condition prevailed early in the week inside the harbor. The ice had gone entirely out of the Superior entry, and the bay about Superior was entirely free. On the Duluth side, however, there was considerable ice, but not so much as a year ago this time. The movement of coal was quite brisk last week, but, of course, fell off with the warm weather. Grain in store 14,500,000 bushels. At this time a year ago the aggregate in store was 11,000,000 bushels.

There are several large lots of lumber at Ashland, Washburn, Duluth and Ontonagon, for Buffalo and Chicago, but there is nothing doing as yet in the way of chartering vessels to move it. Lumber dealers object to paying $2 25 to Chicago or $2 to Buffalo, but as it is certain that there will be a heavy lumber trade, they will probably be forced to come to terms with vessel owners shortly after March 1. Alex R. Sinclair & Co., who do an extensive business in chartering lumber vessels, are now located at Duluth, but Capt. Sinclair will make regular trips to Ashland and will give attention to Ashland business just as he would if the office of the firm was located there.

Speed of Atlantic Passenger Ships.

Following is a list of the principal Atlantic passenger ships with their best average time on voyages during 1895:

Name of steamer.	Best average time in knots.	Name of steamer.	Best average time in knots.
Lucania	22.01	St. Paul	19.45
Campania	21.82	St. Louis	19.56
Teutonic	20.35	Columbia	19.18
Majestic	20.41	Paris	19.87
Etruria	19.67	Augusta Victoria	18.40
Umbria	19.56	Havel	18.78
Germanic	16.94	Lahn	18.36
Servia	16.80	Spree	18.65
Aurania	17.00	Aller	17.74
Britannic	16.00	Trave	17.46
Fuerst Bismarck	20.14	Ems	17.01
New York	20.26	Saale	17.46
Normannia	20.23	Fulda	16.66

J. S. Roffo, marine engineer of Brunswick, Ga., says in a letter to H. G. Trout, Buffalo: "I have given the wheel which you put on the tug Inca a fair trial and I am glad to be able to say that it has improved the boat wonderfully and we are very much pleased with it. In short, 'it works like a charm.'"

THE LATEST OF THE BOOKS OF SAILING DIRECTIONS FOR THE LAKES, ISSUED BY THE HYDROGRAPHIC OFFICE, AND COVERING LAKES ERIE AND ONTARIO, ST. CLAIR AND DETROIT RIVERS AND LAKE ST. CLAIR, MAY BE HAD FROM THE MARINE REVIEW AT $1.

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department on June 30, 1895, contained the names of 3,342 vessels, of 1,241,459.14 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,-642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1895, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,755	857,735.00
Sailing vessels	1,100	300,642.00
Unrigged	487	83,082.00
Total	3,342	1,241,459.00

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1891	204	111,856.45
" " " 1892	169	45,168.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
" " " 1895	93	36,353.00
Total	747	334,634.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal		
	1894.	1893.	1892.	1894.	1893.	1892.
No. vessel pass'ges	14,491	12,008	12,580	3,352	3,341	3,559
T'n'ge, net registd	13,110,366	9,849,754	10,647,203	8,039,106	7,659,068	7,712,028
Days of Navigat'n	234	219	223	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

THE proposition to construct a tunnel under the old river bed at Willow street, Cleveland, should receive support of the strongest kind from local vessel owners, and, if possible, the sympathies and assistance of vessel owners in other lake cities should be extended to this movement. The construction of bridge piers in important channels and harbors must stop everywhere on the lakes. The argument that the draft of vessels in Chicago river is limited on account of tunnels not having been originally placed deep enough under the bed of the river carries little weight. Chicago has for several years past carried out a policy of opposition to the advancement of its marine interests, as far as river improvements are concerned, and if such was not the case the objectionable tunnels would have been lowered long ago and at moderate cost. The work of lowering them would involve only the simplest kind of an engineering problem. A new arch constructed within any of the tunnels would readily permit of the old arch being removed and the river channel thus deepened to any stage that might be required. The necessary enlargement of the tunnel would follow by deepening its roadbed and probably extending approaches to some extent, if the same was required. In many lake harbors the tunnel is now the only solution of the difficulties that shipping has encountered on account of the increase in the number of bridges and the great increase of commerce in narrow channels. Conditions attending the Willow street bridge project in Cleveland are all favorable to a start on the tunnel movement. The spot is probably more crowded by traffic than any other point in a lake harbor. The tunnel can be constructed under a street owned by the city and no land need be appropriated. The first cost would represent something of an increase, but bridges must be replaced in a few years and the cost of maintenance is heavy, especially when an attempt is made to avoid a center pier. Lift bridges, jack-knife bridges and other forms intended to do away with center piers are highly costly at the start and expensive beyond measure in maintenance. Vessel owners in all parts of the lakes must join hands in securing tunnels in place of bridges wherever it is possible to do so. The effort must be of a determined kind, however, as not least among the difficulties to be encountered is the fact that municipal engineers are in most cases sewer builders, pavement builders and bridge builders, and it will be something of a task to bring them to tunnels instead of bridges, although it is admitted by the best engineers, who have had to do with tunnels, that their construction involves only the simplest kind of work.

T. J. ELDERKIN of Chicago, who represents about all that is left of the Seamen's Union on the lakes, is in Washington endeavoring to secure the passage of a measure introduced in the house, some time ago, and which seeks to regulate the number of men to be carried on lake vessels by the tonnage of such vessels. The number of men specified in this bill is in every case far in excess of requirements, and the measure is, as a whole, entirely objectionable, from the standpoint that it seeks to interfere with the vessel owner in the direct management of his property. Ordinarily there would be no need of directing attention to this bill, as the absurd features of it would readily be detected by members of congress, and especially the members of committees having to do with marine affairs, but officers of the Lake Carriers' Association will probably be justified in keeping an eye on Mr. Elderkin and his bill. He is closely allied with the Pacific coast influence that succeeded in passing the Maguire bill in the last congress. Vessel interests on the Atlantic coast are now trying to repeal the Maguire legislation.

ON ACCOUNT of the determined effort among leaders in the present congress to hold down appropriations, the fate of all lake measures that involve a money expenditure of any kind is decidedly uncertain. Even the river and harbor bill, it is thought, will be a disappointment to everybody interested in it. There are, however, two measures in which the lakes are deeply interested that are apparently certain of passage. One of these is Congressman's Burton's bill empowering the secretary of the treasury to make rules for the navigation of St. Mary's river and to enforce the same through the revenue cutter service. Mr. Brice's bill and resolution providing for reports from civil and army engineers on the lake level question carry in one instance a small appropriation but this will probably not prevent the passage of them.

ALTHOUGH not a dissenting vote was heard in the senate, a few days ago, to the passage of a bill providing $400,000 for the construction of two revenue cutters for the lakes, similar to the one now being built by the Globe Co., Cleveland, it is hardly probable that the measure will meet with such clear sailing in the house, where all acts authorizing appropriations, as well as the general appropriation bills, will be held up until the closing days of the session and then scrutinized and cut down.

Ontonagon, a Harbor of Refuge.

Editor MARINE REVIEW:—The business men of Ontonagon desire the assistance of the Lake Carriers' Association, and all vessel interests, in an effort to make Ontonagon harbor a harbor of refuge, and at the same time provide such improvements as are demanded by the lake business of this section. There is no shelter for boats between Copper Harbor and the Apostle islands, a distance of 155 miles. The only place along the shore that offers anything like a place of entry is this harbor, and it is very unsafe without a breakwater. The work of improving Ontonagon harbor and making it a harbor of refuge was begun in 1864, the plan being to build two piers out into deep water and construct a breakwater outside of them, so that vessels and other lake craft could get into shelter and not be exposed to the heavy seas while making their entry between the piers. The breakwater part of the plans has never been carried out, and all craft caught outside in heavy weather, between Copper harbor, 90 miles to the north-east, and the Apostle islands, 65 miles to the west, must weather the storm out, or attempt the hazardous task of entering between the piers and thereby risking great loss of property and human life. The development of the lumber industry in this section of late years has been very great, and it is, of course, well known that we have the richest deposit of copper in the world, as well as a growing industry in the production of granite, sandstone, clay, slate, etc., the development of all of which is retarded on account of the failure of the government to carry out the plan of harbor improvements originally decided upon. But to vessel owners generally the value of a breakwater here, which would provide a harbor of refuge, would be of the highest importance, not only for the Ontonagon trade but for all vessels passing to and from the head of the lakes. It is on this account that I write to your journal, to bring to the attention of all vessel owners a movement that has been started locally in behalf of appropriations for this work.

W. J. POWER.

Ontonagon, Mich., Feb. 26, 1896.

Supplement No. 2 of the 1895-96 issue of the United States Standard Register of Shipping, New York, which is just at hand, contains rules recently adopted by the society publishing the register, for the use and application of electric lights and appliances on board of ships. The supplement also contains a long list of lake vessels that have been or are now being classed by the society.

RAINBOW THE KING OF SHEET PACKINGS.

5,700,000 POUNDS MANUFACTURED AND SOLD SINCE JANUARY 1st, 1890.

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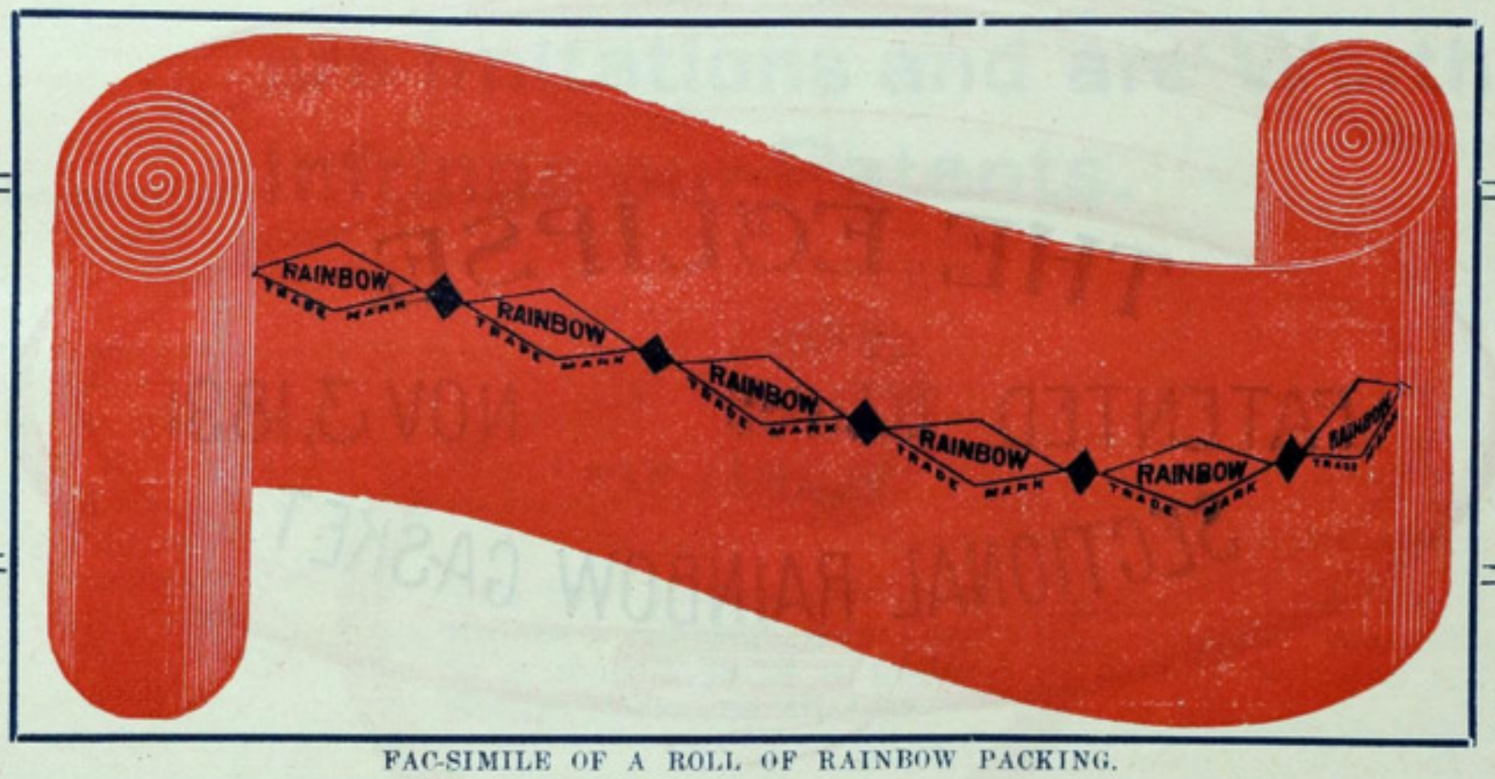
Makes Steam Joints INSTANTLY. No Baking or Following Up.



NONE GENUINE WITHOUT THE TRADE MARK.

FAC-SIMILE OF A ROLL OF RAINBOW PACKING.

The word RAINBOW in a Diamond in Black extending through the entire length of each Roll.

BEWARE OF IMITATIONS, ONLY ONE GENUINE RAINBOW.

NORTHERN STEAMSHIP CO., GREAT NORTHERN RAILWAY LINE.

MR. CHARLES H. DALE, PRESIDENT PEERLESS RUBBER MFG. CO., NEW YORK CITY. On board Steamship North Land, Sept. 12, 1895.

DEAR SIR:—I have used Rainbow packing for steam and hot water pressures of 266 lbs. and 500 to 600 lbs. respectively, and find it superior to all others. Before using Rainbow packing I tried various other packings, including corrugated copper, and found that they would not hold. I therefore tried Rainbow packing, and can cheerfully recommend it as being the only packing for all high pressure in the market to-day.

Respectfully yours, HENRY J. REYNOLDS, Chief Engineer Steamship North Land.

MANUFACTURED EXCLUSIVELY BY

The Peerless Rubber Manufacturing Co.

16 WARREN STREET, NEW YORK.
970 OLD COLONY BUILDING, CHICAGO.

CAUTION.—Some Manufacturers of Red Sheet Packings claim that their Packing is the same, having received Compound from our ex-employees. The fallacy of this claim becomes ridiculous when we assure you that this compound is known to only three persons, all of whom are now in the employ or officers of this Company.

February 1, 1896. **C. H. DALE, President and General Manager.**

For Sale by the LEADING SHIP CHANDLERS AND SUPPLY HOUSES.

The ECLIPSE
Sectional Rainbow Gasket.

1,000,000 Pounds Manufactured and Sold Since November 3d, 1891.

3/8 in. for Pipe Unions.

1/2 in. for Hand-Holes.

In Boxes, 3 to 5 lbs.

5/8 in. for Man-Holes.

3/4 in. for Extra Large Man-Holes.

In Boxes, 4 to 6 lbs.

MADE FROM THE CELEBRATED

Rainbow Packing Compound.

Gentlemen :—

Replying to your inquiry of the 4th, concerning Eclipse Gasket Packing, I would say I have been using it for over two years, and wherever I have tried it, it has given me the best of satisfaction. I have had it last on a man-head over a year, where the head is off every two weeks.

The first time I tried it was on the head of a heater, over 44 inches across, where I had used every kind I knew; it would always leak if the pressure ran up over 100 pounds.

I made a joint with the Eclipse over two years ago and it has never bothered me since.

Yours truly,

W. L. RAYMOND.

Note—Mr. Raymond is Chief Engineer in one of the largest lumber mills in the world.

DIRECTIONS FOR USE.

Lay the Eclipse Gasket rope around the man or hand hole plate, about 1-4 in. from the inside shoulder, and cut the ends off SQUARE, so that they will go around the plate and meet nicely, after which insert the metal tube half way in each end (as shown in sectional cut marked A), butting the ends together; then wind the seam spirally with the gummed tape, lapping the same as shown in cut A. Make your joint as usual. It is NOT necessary to screw up the plate as hard as with the old style gasket, as the Eclipse Gasket will flatten and conform to any seat, no matter how rough it may be.

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The ECLIPSE GASKET is Patented and Trademarked in the United States, England and Canada.

Beware of Cheap Tubings offered. They are Imitations and are Worthless and Infringe our Patents.

FAC SIMILE

— OF —

The first Eclipse Sectional Rainbow Gasket ever put in a man-hole of a boiler. Steam Pressure 160 Lbs.

We have already commenced suit against a Pirating Rubber Company in the United States Courts for infringing our rights, and expect a favorable decision very shortly. This will make it very troublesome and expensive for people using imitations of this Gasket, connected in the way our Gasket is connected. It makes every man liable who has it in his boiler, and we will sue and commence action against any one infringing our rights in any way, shape or manner, either in United States, England or Canada. This is for the benefit of people who are using only the genuine article, as well as dealers and ourselves.

THE PEERLESS RUBBER MANUFACTURING CO.

970 Old Colony Bldg., Chicago. 16 Warren St., New York.

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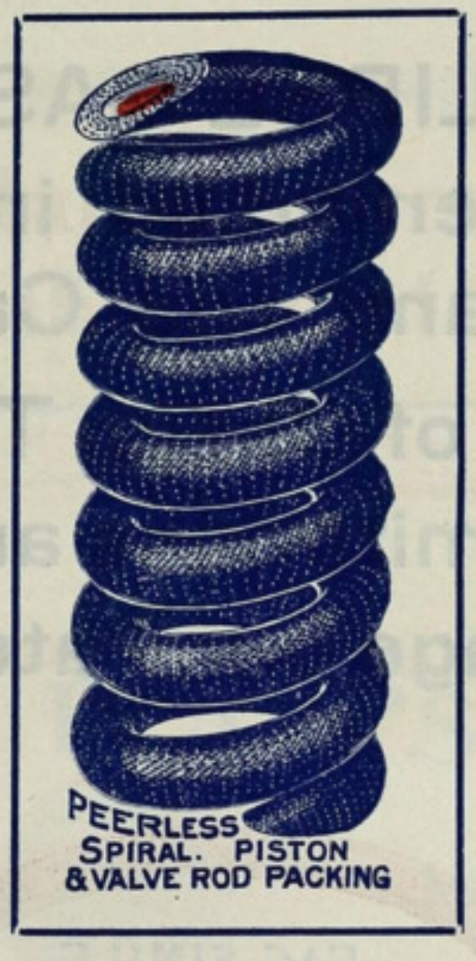
For Sale by the LEADING SHIP CHANDLERS AND SUPPLY HOUSES.

The Peerless Spiral Piston and Valve Rod PACKING.

Twelve to Eighteen Months in High Speed Engines



Will Hold 400 Lbs. of Steam

Twenty Years Old and No Equal.

Owing to repeated requests of Engineers and the Trade, we are now making the Peerless in Spiral Shape. It is in all other respects the same as the

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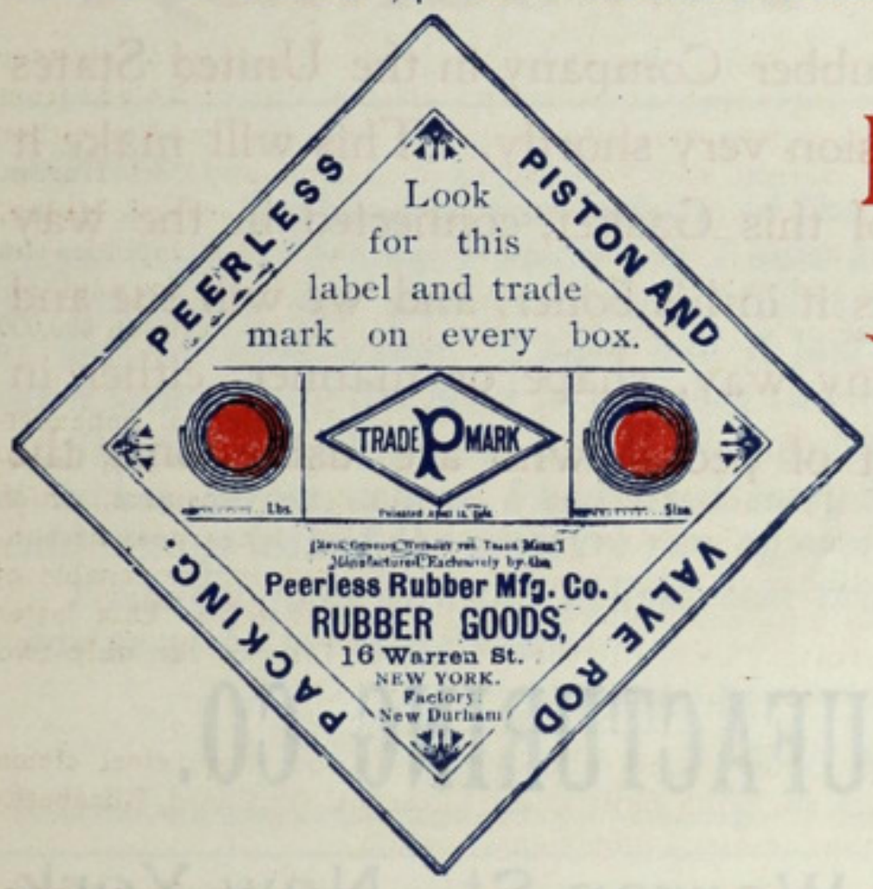

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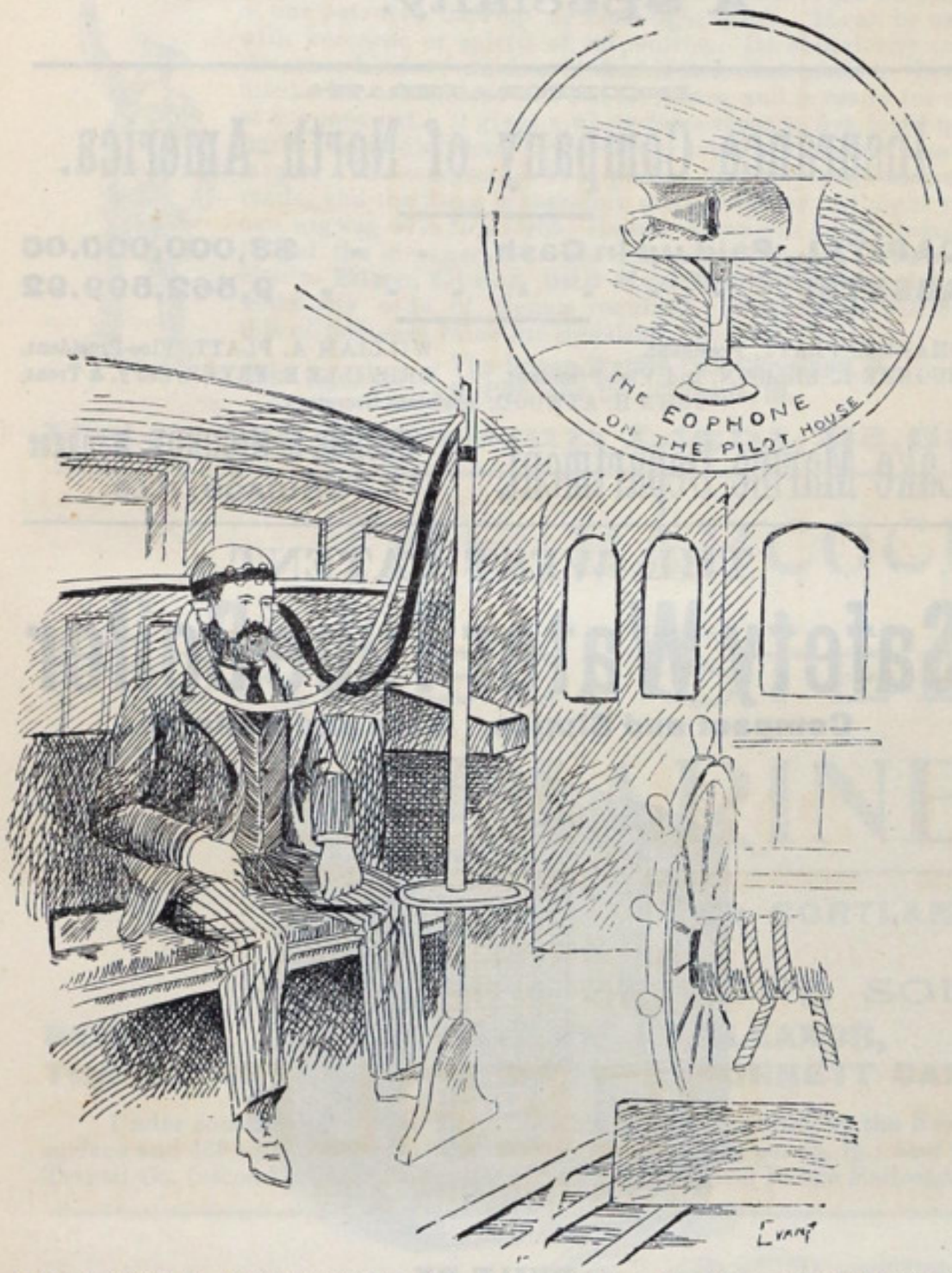
Nicaragua Canal Compared with Similar Works.

Although that portion of the report of the Nicaragua canal commisson which relates to the cost of the undertaking was public property some time before the document was submitted to congress by the president, there is still a great deal of interest in the conclusions of the engineers. The report of the commission, which places the cost of the canal at $133,500,000, does not greatly increase former estimates, but the commission finds that the most serious problems affecting the design and construction of the canal system at the present time, are those which are involved in the heavy rainfall and consequent discharges from the lake and streams, whose variations of surface and volume are very radical and must be taken into account. In a lengthy article on the subject, the Philadelphia Press argues that the cost, in spite of the increase in



THE EOPHONE—DESIGNED TO AID NAVIGATION IN FOG.—DESCRIPTION ON PAGE 5.

the estimate of the government commission, remains within the bounds of the capital which can be raised and the aid which can be legitimately extended by the United States. The Press says:

"As this commission was selected in no friendly spirit and their instructions were evidently intended to render it certain that their estimates included every possible item of cost, the figures which they have now published may be accepted as final. The total outlay needed to connect the oceans may be unhesitatingly placed at between $130,000,000 and $150,000,000. The cost is not likely to be less than the first of these figures, and it is not likely to be greater than the second sum. As canals go this is not an extravagant sum. The Suez canal is ninety-two miles, dug in sand, without rock and with no difficulties, and cost $102,750,000. It has paid dividends from the start. The Manchester canal has cost in all $75,000,000, and although not a success commercially, is built by one city. The Erie canal, 381 miles, cost $52,000,000, raised by one state. These are the only canals comparable in cost. The Nicaragua canal will be 170 miles, and it will be wider and deeper than any of these canals. Under these circumstances a cost of $135,500,000 can be considered neither excessive nor unexpected. If single cities and local corporations can build the canals noted above, the United States, with the resources of a continent, is certainly justified in pushing to completion at this estimated cost a canal which will join the trade of two oceans.

"In considering this estimate of cost it must not be forgotten that it is based on a minimum width of 80 feet. The Suez canal had one of 72 feet, Corinth canal of 75 feet, the Panama canal, in the Culebra cut, 78½ feet, and the St. Mary's lock is 80 feet. In addition the Nicaragua plans call for a berm of 5 feet on each side, and it can there be extended to 90 feet wide in the only parts which will be limited to 80 feet, or 13.1 miles out of 169.5 miles. The estimates now made show, in other words, that the longest, deepest and broadest ship-canal yet proposed can be built for a sum commensurate with that expended on paying canals. Of its difficulties there is no doubt. Instead of being a cut from sea to sea, the Nicaragua canal uses a fresh water lake, and in caring for its outlet tropical rain floods of some 25 feet annually must be secured by dams 75 feet high. The region is volcanic, and almost every conceivable engineering difficulty is to be encountered. If, however, the cost is $150,000,000, there can be no question as to paying a fair return on the investment. The known traffic ready to use the canal is about 8,000,000 tons, and judging from other canals ten or fifteen years would see this double. A charge of $2.50 a ton would be light, and half this would be ample to return 3 per cent."

Around the Lakes.

C. A. Macdonald & Co. of Chicago have not as yet been paid for the work of their wrecking master, Capt. Cyrus Sinclair, in locating the wreck of the Cayuga, sunk in the straits, nearly a year ago, and it is probable that they will be compelled to bring suit for their claim.

Although Mr. John Gordon is no longer vice-president of the Union Transit Co., he is still a director of the company. His efforts to bring about a purchase of the five Menominee line steamers, controlled by M. A. Hanna & Co. and the Globe Iron Works Co., Cleveland, and to make a place for the vessels in the package freight business, have not, it is understood, been successful.

Marine engineers of Detroit, members of association No. 3, have concluded a lease of new quarters in the Merrill building, corner of Woodward and Jefferson avenues. The location is especially desirable, and the engineers consider themselves fortunate in having secured the rooms. They will take possession about March 1 and will arrange to have their new home open the year around. Association No. 3 is prosperous financially and is adding rapidly to its membership.

With a view to hurrying dredging operations in the Detroit river next spring, United States engineers are rapidly pushing the work of sounding the bottom of the channel from Ballard's reef to the Lime-Kiln crossing. The ice enables them to do the work much more easily and quickly than with boats, which have heretofore been used. If the river continues frozen, the work will be continued down as far as Bar point. The work is for the purpose of locating all obstructions in the channel bottom from Ballard's reef to Lake Erie. About twenty five men are employed.

Aaron A. Parker, J. W. Millen and other owners of the Detroit steamer Greyhound have purchased the excursion steamer City of Toledo from the Toledo & Island Steamboat Co. of Toledo and will run her either between Toledo, Detroit and Port Huron or Detroit and Port Huron. She will be in the pool of river steamers controlled by Parker & Millen, John Pridgeon, Charles F. Bielman and others, and which includes the steamers Greyhound, Cole, Idlewild and Arundel. The price paid for the City of Toledo is not given out but it is said to be between $90,000 and $100,000.

Mr. J. W. Kellogg, representing the General Electric Co. Schenectady, N. Y., has closed a contract with the Globe Iron Works Co., Cleveland, for electrical outfits on the two new Rockefeller steamers, which will, with the steamer Coralia, be the largest on the lakes next season. Each steamer will have direct connected dynamo and engine capable of maintaining 125 lights, and the fixtures will be water-tight. This latter feature is important. The Zenith City and Queen City are the only two steamers on the lakes equipped in this way.

Roberts water tube boilers will be used in the three steel steam canal vessels that are being built at the Crescent Ship Yard, Elizabethport, N. J., for the Cleveland Steel Canal Boat Co.

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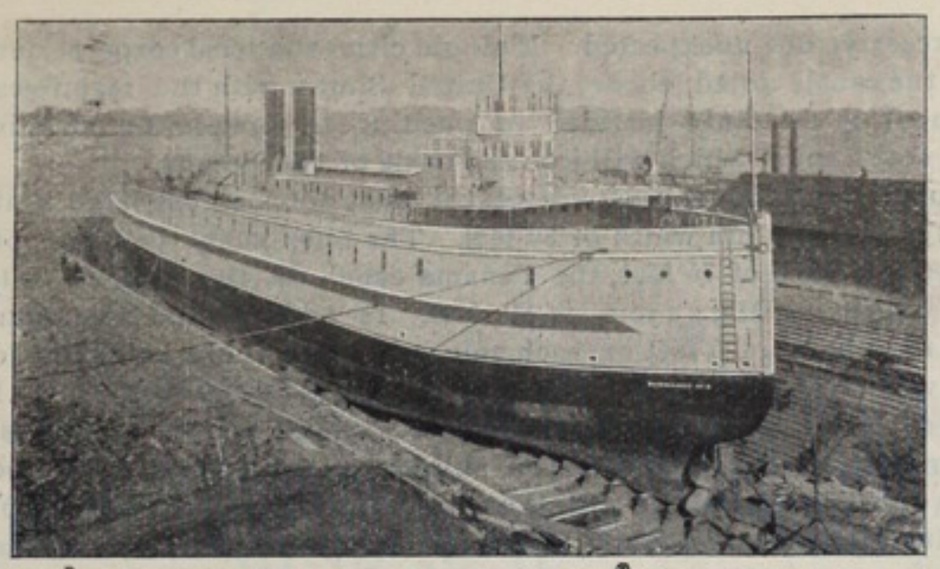

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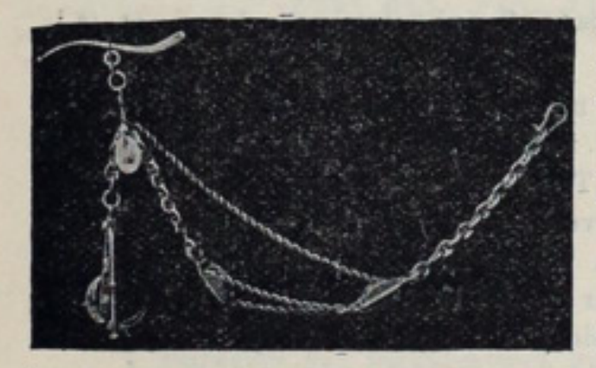

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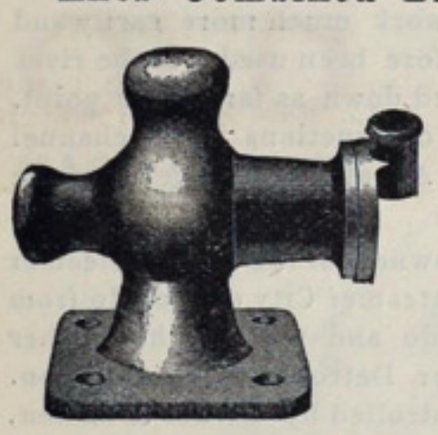

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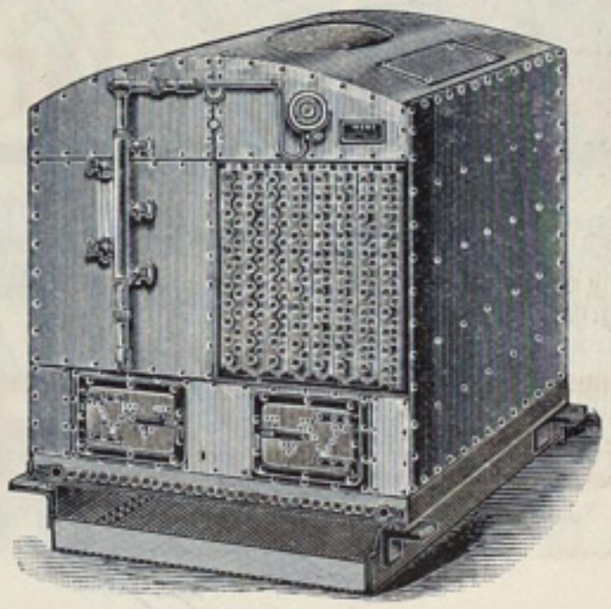

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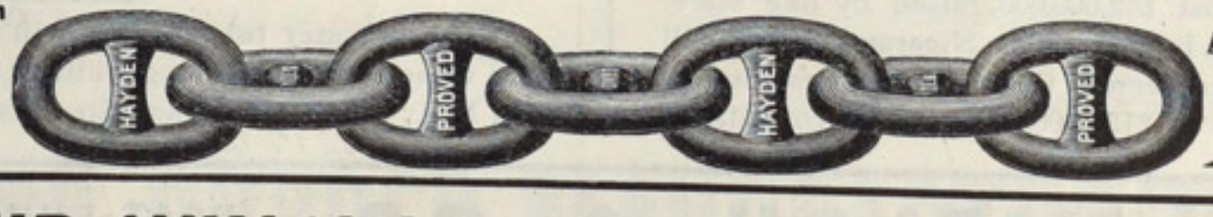

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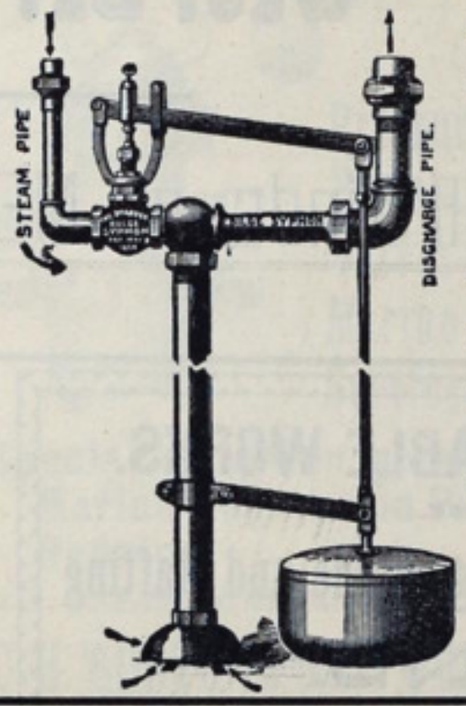

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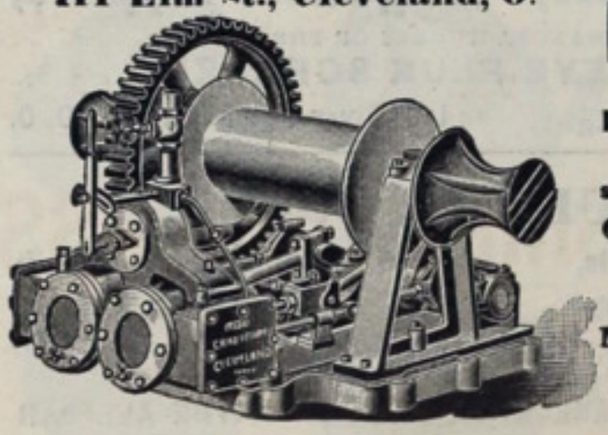

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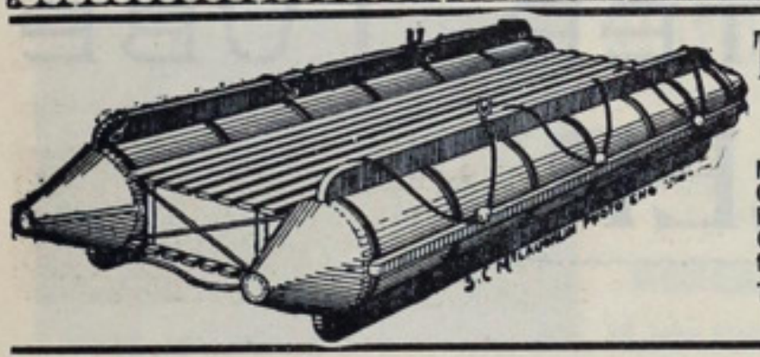

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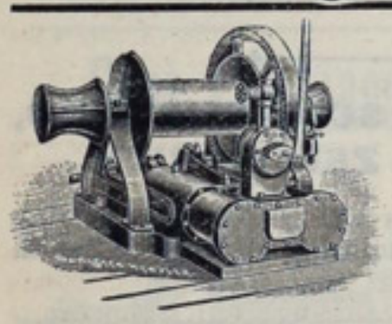

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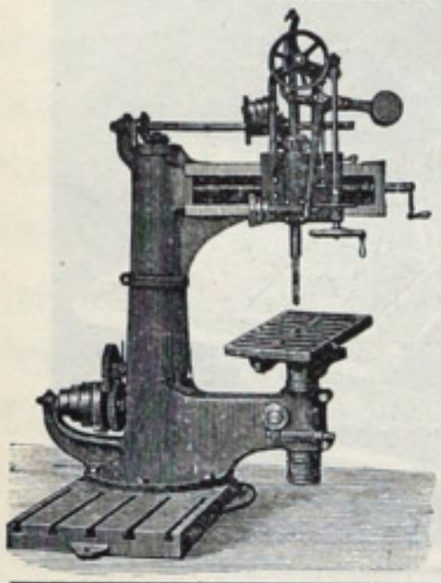

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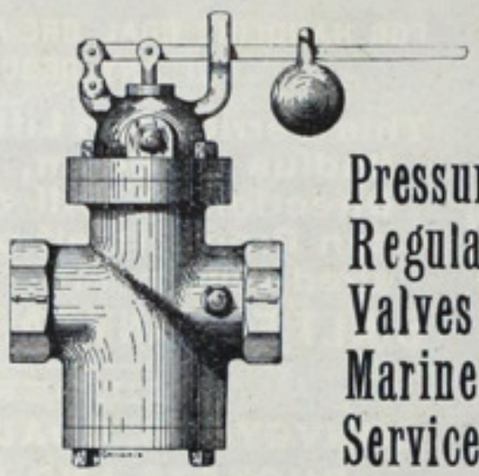

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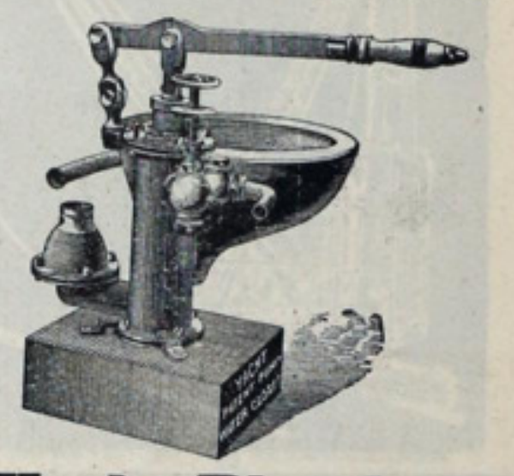

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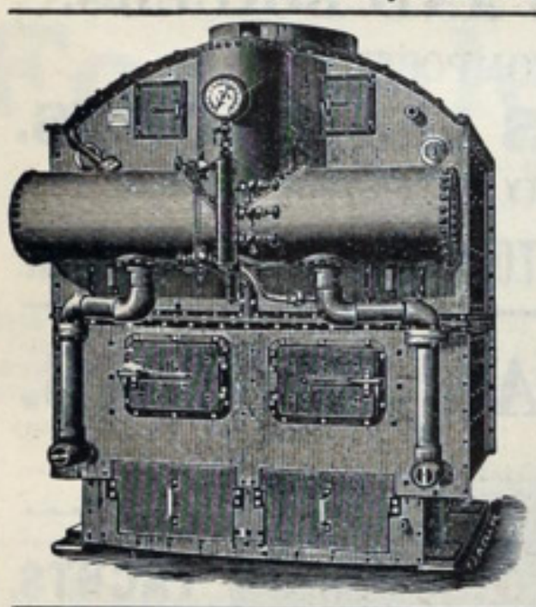

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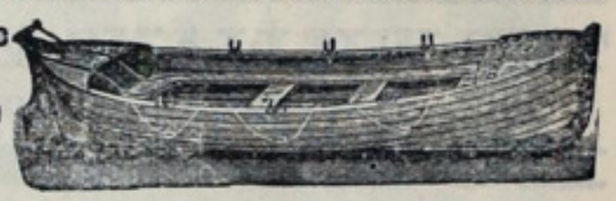

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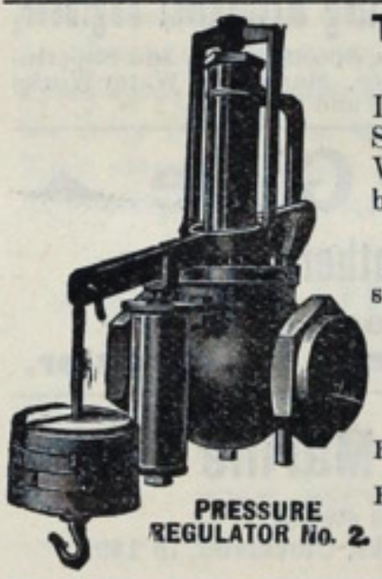

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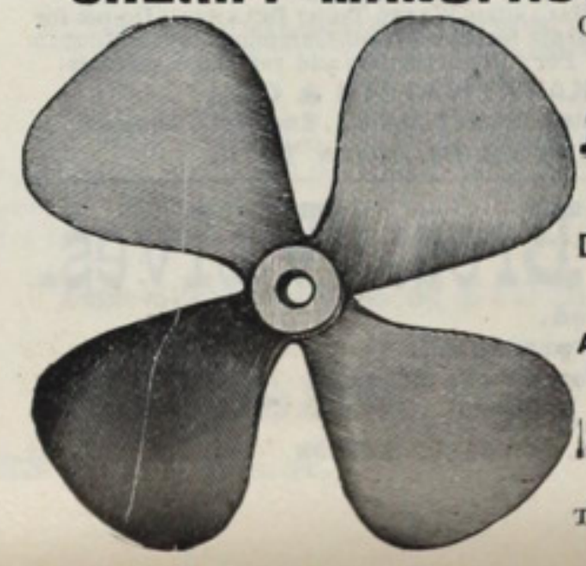

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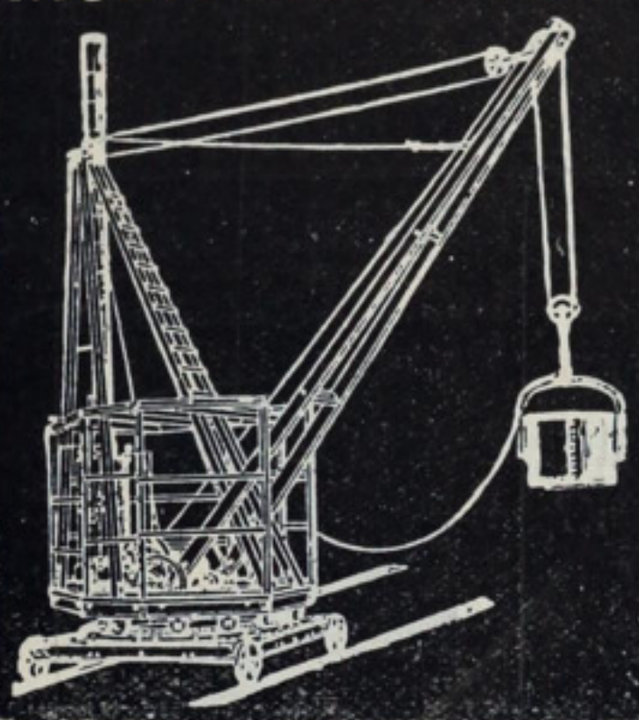

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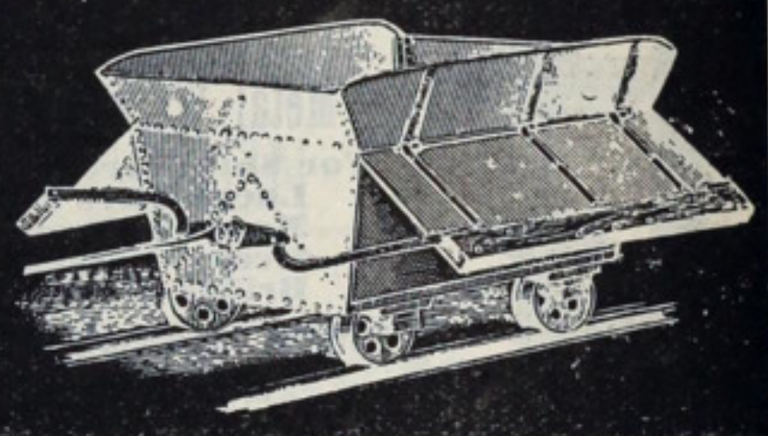

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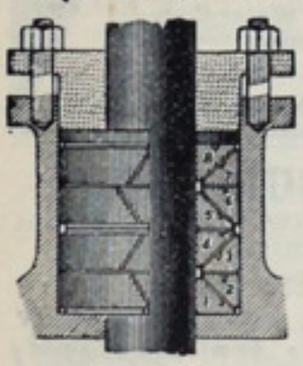

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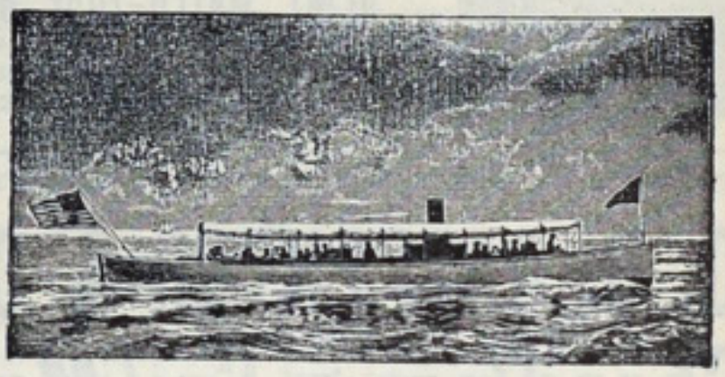

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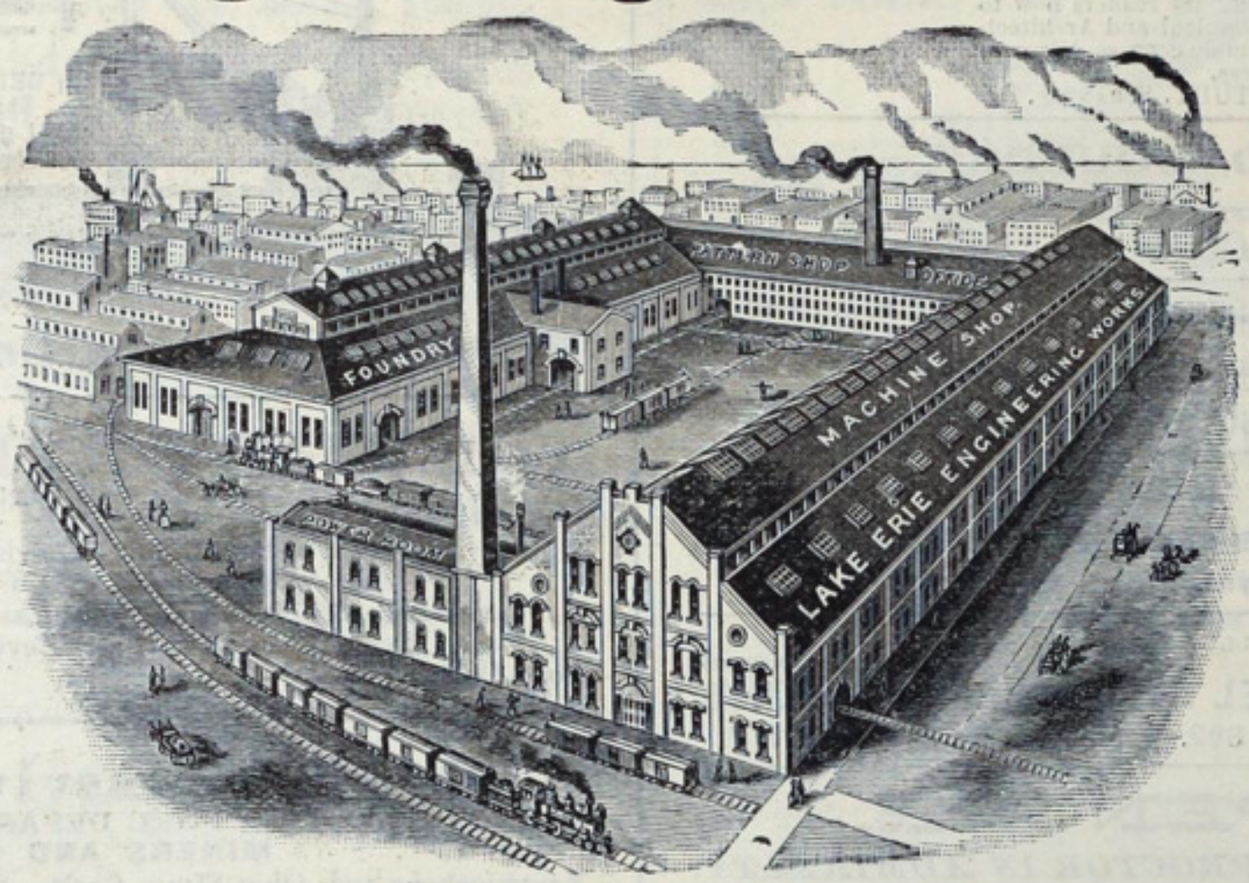

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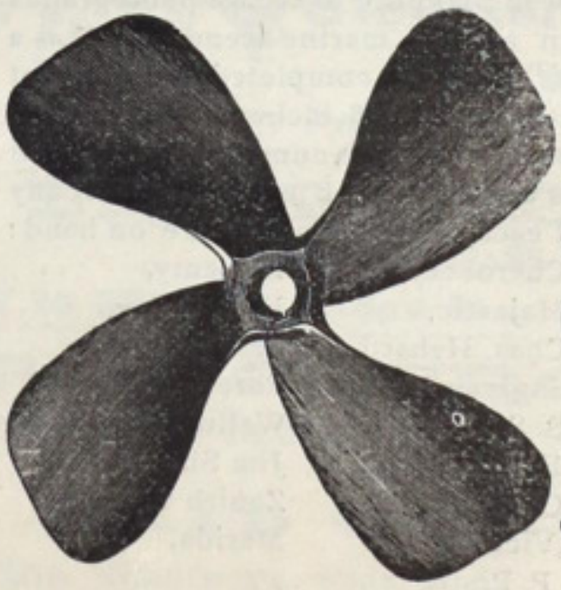
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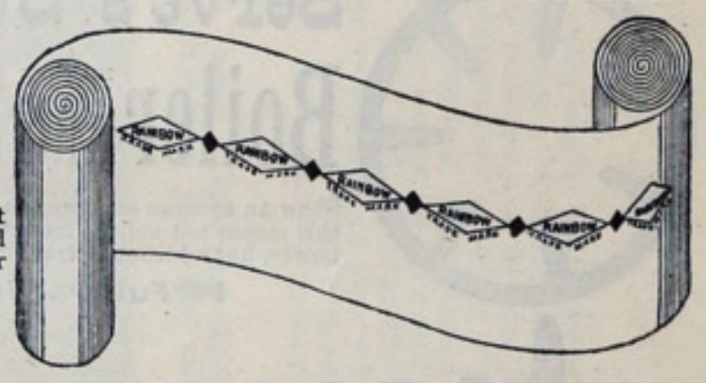

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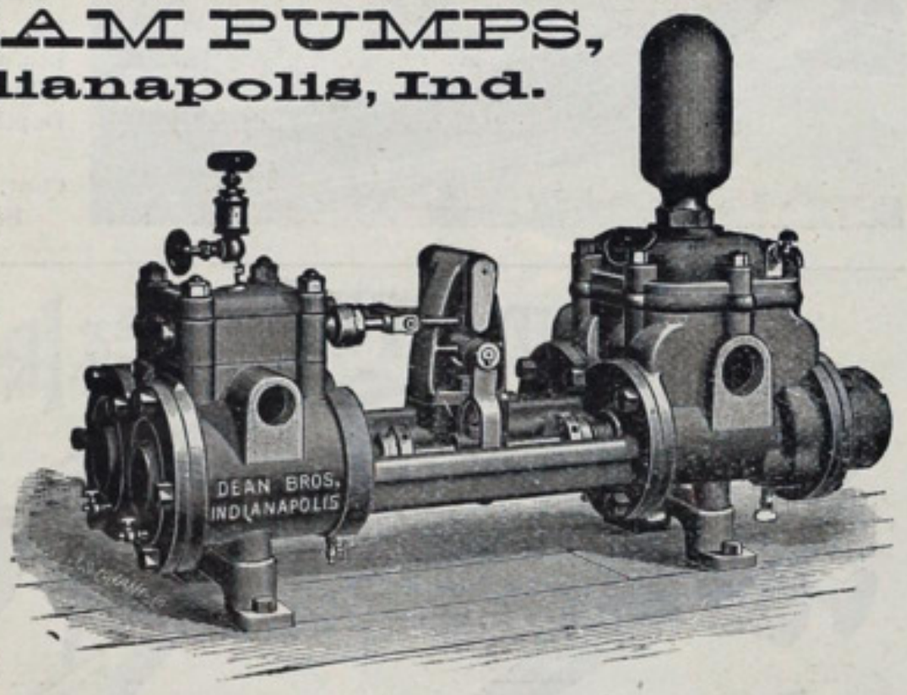

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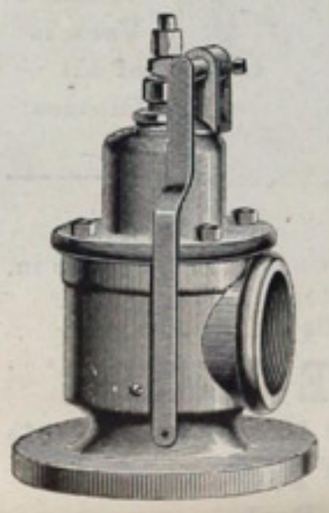

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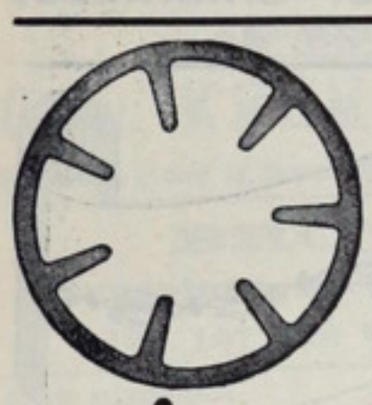

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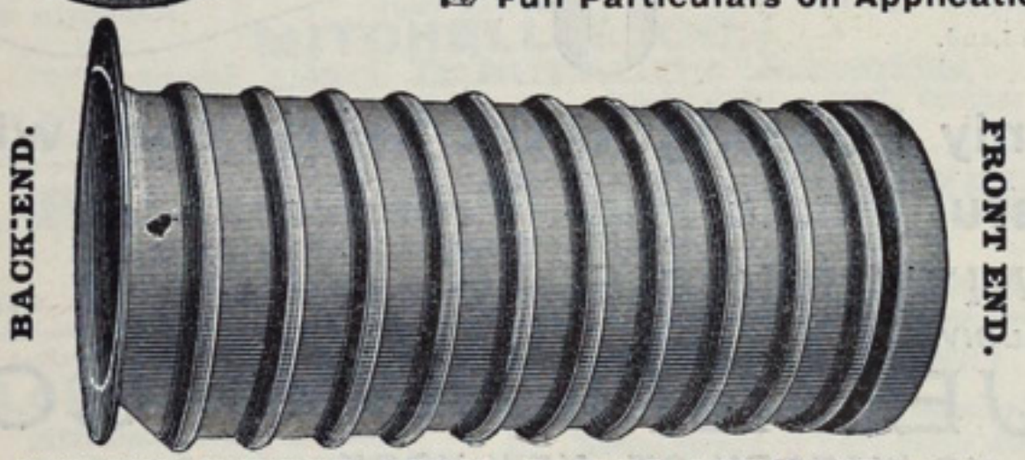

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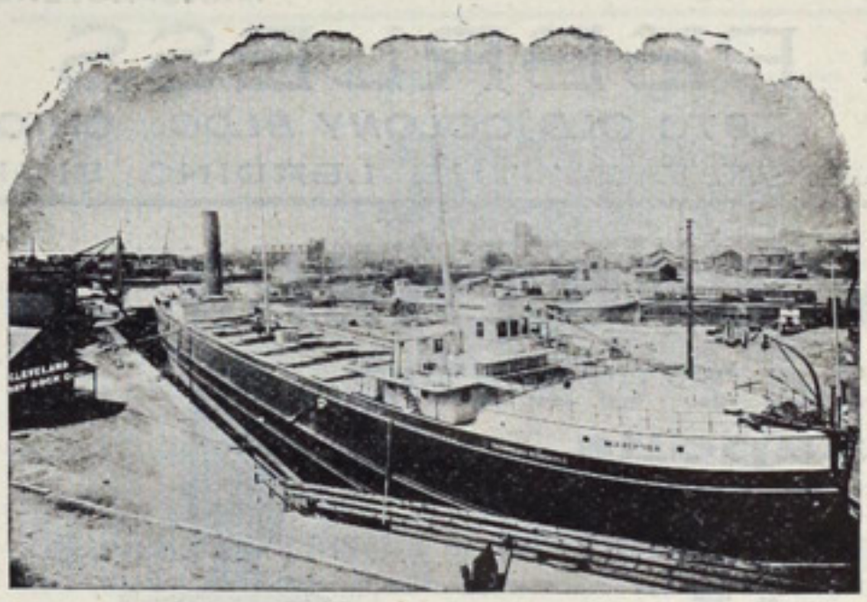

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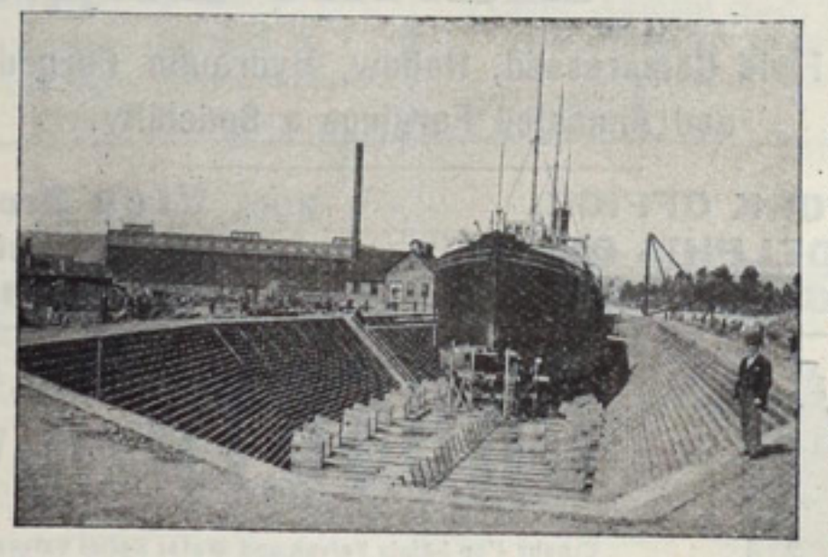

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